

In the Claims

Claims 29-37 have been cancelled without prejudice.

1. (Original) A zircon refractory material having a composition including the following elements:

ZrSiO₄ (98.75-99.68 wt%)

ZrO₂ (0.01-0.15 wt%)

TiO₂ (0.23-0.50 wt%)

Fe₂O₃ (0.08-0.60 wt%).

2. (Original) The zircon refractory material of Claim 1, wherein said ZrSiO₄ includes a known amount of TiO₂ and Fe₂O₃ not counting said TiO₂ (0.23-0.50 wt%) and Fe₂O₃ (0.08-0.60 wt%).

3. (Original) The zircon refractory material of Claim 1, wherein a binder and a dispersant were added to batch materials including ZrSiO₄, ZrO₂, TiO₂ and Fe₂O₃ all of which are used to make said zircon refractory material wherein said binder and said dispersant were burned out during a sintering process to form said zircon refractory material.

4. (Original) The zircon refractory material of Claim 3, wherein said binder (2.00-4.00%) is polyethylene glycol.

5. (Original) The zircon refractory material of Claim 3, wherein said dispersant (0.06-0.25%) is polyelectrolyte.

6. (Original) The zircon refractory material of Claim 3, wherein said dispersant (0.06-0.25%) is ammonium polymethacrylate and water.

7. (Original) The zircon refractory material of Claim 1, wherein said zircon refractory material has the following composition:

ZrSiO₄ (98.75-99.65 wt%)

ZrO₂ (0.02-0.15 wt%)

TiO₂ (0.23-0.50 wt%)

Fe₂O₃ (0.10-0.60 wt%).

8. (Original) The zircon refractory material of Claim 1, wherein said zircon refractory material has the following composition:

ZrSiO₄ (98.95-99.55 wt%)
ZrO₂ (0.03-0.15 wt%)
TiO₂ (0.30-0.45 wt%)
Fe₂O₃ (0.12-0.45 wt%).

9. (Original) The zircon refractory material of Claim 1, wherein the zircon refractory material is used in a glass manufacturing system.

10. (Original) A method for producing a zircon refractory material, said method comprising the steps of:

mixing a plurality of batch materials including:

ZrSiO₄ (by difference)
ZrO₂ (0.01-0.15 wt%)
TiO₂ (0.23-0.50 wt%)
Fe₂O₃ (0.08-0.60 wt%);

forming into a shape the mixed batch materials; and

firing the shaped mixed batch materials to form said zircon refractory material.

11. (Original) The method of Claim 10, wherein said step of forming includes:

spray drying the mixed batch materials; and

pressing the spray dried batch materials to form the shaped mixed batch materials.

12. (Original) The method of Claim 10, wherein said ZrSiO₄ includes a known amount of TiO₂ and Fe₂O₃ not counting said batched TiO₂ (0.23-0.50 wt%) and Fe₂O₃ (0.08-0.60 wt%).

13. (Original) The method of Claim 10, wherein a binder and a dispersant were added to batch materials including ZrSiO₄, ZrO₂, TiO₂ and Fe₂O₃ all of which are used to make said zircon refractory material wherein said binder and said dispersant were burned out during a sintering process to form said zircon refractory material.

14. (Original) The method of Claim 13, wherein said binder (2.00-4.00%) is polyethylene glycol.

15. (Original) The method of Claim 13, wherein said dispersant (0.06-0.25%) is polyelectrolyte.

16. (Original) The method of Claim 13, wherein said dispersant (0.06-0.25%) is ammonium polymethacrylate and water.

17. (Original) The method of Claim 10, wherein said zircon refractory material has the following composition:

ZrSiO_4 (by difference)

ZrO_2 (0.02-0.15 wt%)

TiO_2 (0.23-0.50 wt%)

Fe_2O_3 (0.10-0.60 wt%).

18. (Original) The method of Claim 10, wherein said zircon refractory material has the following composition:

ZrSiO_4 (by difference)

ZrO_2 (0.03-0.15 wt%)

TiO_2 (0.30-0.45 wt%)

Fe_2O_3 (0.12-0.45 wt%).

19. (Original) The method of Claim 10, wherein the zircon refractory material is used in a glass manufacturing system.

20. (Original) A glass manufacturing system comprising:

at least one vessel for melting batch materials; and

a forming vessel for receiving the melted batch materials and forming a glass sheet, wherein at least a portion of said forming vessel is made from a zircon refractory material having a composition including the following elements:

ZrSiO_4 (by difference)

ZrO_2 (0.01-0.15 wt%)

TiO_2 (0.23-0.50 wt%)

Fe_2O_3 (0.08-0.60 wt%).

21. (Original) The glass manufacturing system of Claim 20, wherein said at least one vessel includes a melting, fining, mixing or delivery vessel.

22. (Original) The glass manufacturing system of Claim 20, wherein said ZrSiO₄ includes a known amount of TiO₂ and Fe₂O₃ not counting said batched TiO₂(0.23-0.50 wt%) and Fe₂O₃ (0.08-0.60 wt%).

23. (Original) The glass manufacturing system of Claim 20, wherein a binder and a dispersant were added to batch materials including ZrSiO₄, ZrO₂, TiO₂ and Fe₂O₃ all of which are used to make said zircon refractory material wherein said binder and said dispersant were burned out during a sintering process to form said zircon refractory material.

24. (Original) The glass manufacturing system of Claim 23, wherein said binder is polyethylene glycol.

25. (Original) The glass manufacturing system of Claim 23, wherein said dispersant is polyelectrolyte.

26. (Original) The glass manufacturing system of Claim 23, wherein said dispersant is ammonium polymethacrylate and water.

27. (Original) The glass manufacturing system of Claim 20, wherein said zircon refractory material has the following composition:

ZrSiO₄ (by difference)
ZrO₂ (0.02-0.15 wt%)
TiO₂ (0.23-0.50 wt%)
Fe₂O₃ (0.10-0.60 wt%).

28. (Original) The glass manufacturing system of Claim 20, wherein said zircon refractory material has the following composition:

ZrSiO₄ (by difference)
ZrO₂ (0.03-0.15 wt%)
TiO₂ (0.30-0.45 wt%)
Fe₂O₃ (0.12-0.45 wt%).

Claims 29-37 (Cancelled).